

What is Claimed is:

1. A drive unit for a brushless fan motor including a stator provided thereon with a plurality of excitation windings and a rotor including a plurality of rotor magnetic poles each constituted by a permanent magnet, comprising:

a position detector for detecting a position of said rotor of the brushless fan motor;

a rotational speed detecting means for detecting a rotational speed of said rotor;

a plurality of excitation changing over semiconductor switches each connected in series to each of said excitation windings so as to permit an excitation current to flow therethrough to each of said excitation windings when they are turned on;

a drive circuit for outputting an on/off change-over signal for said excitation changing over semiconductor switches depending on an output of said position detector;

a power feed semiconductor switch arranged between said excitation windings and a power supply so as to permit power to be fed from said power supply therethrough to said excitation windings when it is turned on; and

a power control circuit for outputting a control signal which acts to control the on/off operation of said power feed semiconductor switch, thereby controlling the rotational speed of said rotor;

said power control circuit controlling the on/off operation of said power feed semiconductor switch based on the

value of the target rotational speed of said rotor given as a speed command and the actual rotational speed obtained by said rotational speed detecting means;

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said power control circuit being constructed so that after the rotational speed of said rotor is stabilized, said power feed semiconductor switch may have turn-off time set shorter when an actual rotational speed is slower, in comparison, than said target rotational speed, and set longer when an actual rotational speed is faster than said target rotational speed, and set as it is when an actual rotational speed is substantially equal to said target rotational speed.

2. A drive unit for a brushless fan motor as defined in claim 1, wherein said hall device for detecting the magnetic flux of said plural permanent magnets is provided on the side of said stator;

said position detector and said rotational speed detecting means detect position and rotational speed of said rotor based on the output of said hall device.

3. A drive unit for a brushless fan motor as defined in claim 1, wherein, until the rotational speed of said rotor is stabilized, said turn-off time and said turn-on time of said power feed semiconductor switch is set at a predetermined value.

4. A drive unit for the brushless fan motor as defined in claim 1, wherein said power control circuit normally sets said target rotational speed at a normal rotational speed which is slower than a maximum rotational speed, and set said turn-off time at zero (0) so as to rotate said rotor at said maximum

speed, when said speed command is not entered while power is fed from said power supply.

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5. A drive unit for a brushless fan motor as defined in claim 1, wherein said power feed semiconductor switch is turned off or an alarm is given when the rotational speed of said rotor does not reach or surpass a predetermined rotational speed, after said speed command is entered.

6. A drive unit for a brushless fan motor which includes:  
a stator provided thereon with a plurality of excitation windings and a rotor including a plurality of rotor magnetic poles each constituted by a permanent magnet, comprising:

a position detector for detecting a position of said rotor of the brushless fan motor;

a rotational speed detecting means for detecting a rotational speed of said rotor;

a plurality of excitation changing over semiconductor switches each connected in series to each of said excitation windings so as to permit an excitation current to flow therethrough to each of said excitation windings when they are turned on; and

a drive circuit for outputting an on/off change-over signal for said excitation changing over semiconductor switches depending on an output of said position detector;

a power feed semiconductor switch arranged between said plurality of excitation windings and a power supply so as to feed power therethrough to said excitation windings from said power supply when it is turned on;

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a power control circuit for controlling the rotational speed of said rotor by controlling the on/off operation of said power supply semiconductor switch;

said power control circuit controlling the on/off operation of said power feed semiconductor switch based on the value of the target rotational speed of said rotor given as a speed command and the actual rotational speed obtained by said rotational speed detecting means;

said power control circuit being constructed so that after the rotational speed of said rotor is stabilized, said power feed semiconductor switch may have turn-on time set longer when an actual rotational speed is slower, in comparison, than said target rotational speed, and set shorter when an actual rotational speed is faster than said target rotational speed, and set as it is when an actual rotational speed is substantially equal to said target rotational speed.

7. A drive unit for a brushless fan motor as defined in claim 6, wherein said hall device for detecting the magnetic flux of said plural permanent magnets is provided on the side of said stator;

said position detector and said rotational speed detecting means detect position and rotational speed of said rotor based on the output of said hall device.

8. A drive unit for a brushless fan motor as defined in claim 6, wherein, until the rotational speed of said rotor is stabilized, said turn-off time and said turn-on time of said power feed semiconductor switch is set at a predetermined value.

9. A drive unit for the brushless fan motor as defined in claim 6, wherein said power control circuit normally sets said target rotational speed at a normal rotational speed which is slower than a maximum rotational speed, and set said turn-off time at zero (0) so as to rotate said rotor at said maximum speed, when said speed command is not entered while power is fed from said power supply.

10. A drive unit for a brushless fan motor as defined in claim 6, wherein said power feed semiconductor switch is turned off or an alarm is given when the rotational speed of said rotor does not reach or surpass a predetermined rotational speed, after said speed command is entered.

11. A method to control a plurality of brushless fan motors wherein the plural fan motors are set to rotate at a normal rotational speed which is slower than a maximum speed of respective fan motor and the remaining fan motors are set to rotate at the respective maximum speed, when at least one or more brushless fan motors are halted.